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THEODORE DEHONE JUDAH, M. Am. Soc. C. E.*

DIED NOVEMBER 2D, 1863.

Theodore Dehone Judah, to whom the first transcontinental railway in this country owes in a large measure its incorporation and early success, came from a family which settled at Westport, Conn., in the early days of the colony. His father was an Episcopal clergyman, and it was while he was rector of St. John's Church in Bridgeport, Conn., that the subject of this memoir was born, the date being March 4th, 1828. Soon afterward the family moved to Troy, N. Y., where the father was called to be the rector of St. John's Church, and the son received his early education in that city, studying at the Rensselaer Polytechnic Institute at one time. The father died before the son's studies were completed, however, and the family moved to New York City.

By this time the young man was convinced that his talents destined him for the profession of engineering, and he soon joined the staff of S. W. Hall, then engineer of the Troy and Schenectady Railroad Company, and began his railroad career. Afterward he served under James Laurie, first President of this Society, and was engaged on the New Haven, Hartford and Springfield Railway and the Connecticut River Railroad. Another work of his in New England, which he referred to with pride, was the construction of a railroad bridge at Vergennes in Vermont. Subsequently he was a resident engineer on the Erie Canal, located at Jordan and Seneca Falls, and afterward was engineer of the railroad down the gorge of the Niagara River to Lewiston, a work which was considered a remarkable feat in those days, and resulted in his engagement as engineer of the first California railroad. He was employed on the construction of the Buffalo and New York Railroad, then pushing across the state to connect with the Erie line, when he received a telegram from Governor Seymour, who was acquainted with the Niagara line and the difficulties presented by its construction, to go to New York at once. There he met Colonel Charles L. Wilson, who was enthusiastic over the proposed railroad between Sacramento and Folsom, and immediately accepted the position of chief engineer of the enterprise. In a short time he and his

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wife were on their way to the Pacific Coast, and from then until his untimely death, his work assumes a character of great commercial importance. In a brief biography of her husband, Mrs. Judah states, "that everything he did from the time he went to California to the day of his death was for the great continental Pacific railway. It was the burden of his thought day and night and largely of his conversation."

It was as the chief engineer of the Central Pacific Railroad that Judah achieved his greatest reputation, not only as an engineer, but also as a promoter, using the word in its best sense. He was identified with California railroading from its beginning. The State Legislature passed a general law for the organization of railroad companies in 1850, and after it was amended several times, active preparation for work on a road was begun in 1853 by the Sacramento Valley Railroad Company. The most important step taken was the engagement of Judah as the engineer of the enterprise, in the manner mentioned. Immediately after reaching California he selected a route from Sacramento to Folsom, a distance of 32 miles. Grading was commenced early in 1855, and tracklaying in the summer, as soon as rails arrived. The road was opened in February, 1856, but did not prove as profitable as was anticipated. It was purchased nine years later by the principal owners of the Central Pacific Railroad Company.

A large part of Judah's time during the next three years was spent in Washington endeavoring to procure the passage of a bill making grants of land in California for railroad purposes. Congress was not disposed at that time to take any definite action on the subject of a transcontinental railroad, then attracting considerable attention on the Pacific coast, so a railroad convention was held at Sacramento in September, 1859, to consider the matter. Each county in California, Oregon, Washington and Arizona was requested to send as many delegates as it had members in the state or territorial legislatures. The attendance was large. Among the delegates certainly the best posted and probably the most efficient was Judah, who was present as a member from Sacramento. He had studied the engineering problems of a transcontinental road and was thoroughly convinced of the practicability of such a project. It was chiefly due to the fullness, clearness and satisfactory character of the information he furnished that the convention declared its decided preference among the routes mentioned for the central one advocated by him, and appointed him to act as its accredited agent in presenting its proceedings to the President, Cabinet and Congress, and in promoting favorable action on a Pacific railroad bill.

The Washington mission was unsuccessful, owing to the sectional jealousy so strong at that time. Mr. Judah wrote out a full report of his work, which he sent to the executive committee of the convention with many important documents. An unusual part of the report was a statement that although the expenses of his mission had cost him $2 500, the only bills he had to present were two small accounts for

printing, amounting together to $40. In spite of the temporary failure of this congressional campaign, he returned to California with unabated confidence in the project and endeavored to arouse greater local support for a continuance of the agitation. His first attempt to raise funds was made in San Francisco, but in spite of the fact that some of the capitalists to whom he presented his plans recognized their importance, the local business field offered such inducements of large and immediate returns that they did not care to back an enterprise bound to require great expenditures before any profit could be realized. Undismayed by his failure at San Francisco, Judah went to Sacramento, where he was sure of the influence of General Lauren Upson, editor of the Sacramento *Union*.

Among his fellow townsmen of Sacramento were four merchants, Collis P. Huntington, F. Am. Soc. C. E., and Mark Hopkins, who were hardware dealers; Charles Crocker, who was in the dry goods business, and Leland Stanford, who dealt in provisions and groceries. The first two had been in California since 1849; none of them was rich. These four men with Judah formed a quintette in which the deficiencies of any one member were remedied by the characteristics of the others. It was through their assistance and under the personal direction of Judah that the different routes over the Sierra Nevada Mountains were examined and compared.

The Central Pacific Railroad Company was organized on June 28th, 1861, under the laws of California, with a capital stock of $8 500 000 in $100 shares. C. P. Huntington, Leland Stanford, Mark Hopkins and Charles Crocker made liberal subscriptions to the stock, and a number of other citizens of Sacramento subscribed for smaller amounts. Judah organized his engineering parties again and crossed the mountains more than twenty times before making his final location. He confined his attention chiefly to three routes; the first through El Dorado County by way of Georgetown, the second through Illinoistown and Dutch Flat, and the third by the way of Nevada and Henness Pass. The Dutch Flat route proved the most practicable, as by it he could attain the summit at Donner Pass with lighter grades, at less distance, and with fewer obstacles than by any other line.

The problem presented was to ascend 7 000 ft., the height of Donner Pass, in a distance of not much more than 70 miles. After careful examination a long and unbroken spur of the Sierra Nevadas was found extending southwesterly from Donner Pass to the Sacramento Valley. By keeping on or near the ridge of this spur, the summit could be attained with a maximum grade not exceeding 105 ft. to the mile along a route crossing but one stream, and that a small one. On the other hand, the eastern slope of the Sierras could be descended as far as the Truckee River by means of two ravines south of Lake Donner, with a maximum grade of 140 ft. per mile. Judah's route followed the Truckee from a point near the outlet of Lake Donner, and about 14 miles north of Lake Tahoe, through the eastern ridge and Washoe

Mountains to Big Bend in the Humboldt Desert, giving a grade not exceeding 40 ft. to the mile and entirely avoiding the second or eastern ridge of mountains. The distance from Sacramento to the Truckee was 123 miles by this route, and 145 miles to the State line. Judah estimated that eighteen tunnels would be necessary, and that the road could be kept free from snow throughout the year. The probable cost of the road was given as about $88 500 per mile for the entire 145 miles to the State boundary.

As soon as his report was made he was sent to Washington to procure aid for the construction of the road. He became acquainted with members of the committees on the Pacific Railroad in both branches of Congress and was appointed Secretary of both, with the privilege of the floor in both Senate and House. Although the opposition previously offered by southern Congressmen was wanting in this session by reason of the civil war, there were many obstacles to be overcome and much tactful manœuvering and compromise necessary before the desired legislation was obtained on July 1st, 1862. The act contained references to three companies. It incorporated the Union Pacific Railroad Company for constructing a part of the transcontinental route, provided for the construction of another part by the Leavenworth, Pawnee and Western Railroad Company of Kansas, and gave to the Central Pacific Railroad Company the recognition and privileges it had been struggling so hard to obtain. It was provided that the company might construct a railroad and telegraph line from the Pacific Coast, at or near San Francisco, or the navigable waters of the Sacramento River, to the eastern boundary of California. Right of way for 200 ft. on each side of the road was granted, and all ground needed for buildings and five alternate sections of public land, per mile, on each side of the line, or all the odd sections within the limits of 10 miles on each side which had not been sold, reserved or otherwise disposed of, except mineral lands. In consideration of the mountainous character of the country for 150 miles west from the eastern base of the Rocky Mountains, and for 150 miles east from the western base of the Sierra Nevada Mountains, the Secretary of the Treasury was instructed to issue to the company constructing these sections bonds to the amount of $48 000 per mile; the bonds to be issued and the lands granted set apart on the completion of every 20 miles of these portions of the road. The amount of bonds to be issued for the intermediate country between the Sierra Nevada and the Rocky Mountains was fixed at $32 000 per mile, and $16 000 for the remaining sections. The company had to build 50 miles in the first two years and 50 miles each additional year, half the amount of construction required of the Union Pacific Company.

Judah lost no time in filing in the office of the Secretary of the Interior the necessary maps and papers relating to the route of the Central Pacific Railroad, thereby securing the withdrawal from sale of land along the line. He made arrangements in New York for rails and other equipment for the first 50 miles of road, and late in July sailed

for San Francisco, carrying with him a testimonial from a number of senators and representatives as to the value and effectiveness of his work.

The first shovelful of earth taken on the work of construction was moved at Sacramento by Leland Stanford on January 8th, 1863, the day following his inauguration as Governor of California. In spite of the national assistance granted during the preceding summer, work progressed slowly and capital was enlisted with difficulty. By this time the leading men in the enterprise had found the work best suited for each. Huntington became the eastern financial manager, and Stanford the western, Crocker devoted himself to superintending the construction, Hopkins looked after the supplies, and Judah superintended the engineering work. Six months later, Judah filed a report estimating the cost of the first 50 miles of the road at nearly $3 250 000; at this time, the bridge over the American River was nearly completed and about 18 miles graded. Six thousand tons of rails had been purchased, six locomotives and about fifty cars.

In October of the same year, he sailed from San Francisco to urge further legislation by Congress for the transcontinental railroads, and to affect certain changes in the company. The latter are best indicated by the following quotation from Mrs. Judah's memoir of the husband.

"Mr. Judah saw he must place himself differently, and he went to work to accomplish it. He had secured the right and had the power to buy out the men opposed to him and the true interests of the Pacific Railroad at that time. Everything was arranged for a meeting in New York City on his arrival. Gentlemen from New York and Boston were ready to take their places. They could not see him. Two of the gentlemen came to see me in Greenfield, thinking I might be able to give them points for their interest."

He was attacked by fever on the journey, and died on November 2d, 1863, at New York. His work was carried on by the parties before mentioned, who had furnished financial backing to the enterprise, until it has expanded into one of the most powerful railway systems of the world. Judah was, in a measure, its founder and most influential advocate, and it was largely through his manifold talents, apart from engineering, that a transcontinental railway was recognized as of national importance by Congress.

Mr. Judah was elected a Member of the American Society of Civil Engineers on May 4th, 1853.